Listing of the Claims

1. (Currently Amended) A diagnostic imaging system ~~(10)~~ including:

a diagnostic imaging scanner ~~(12)~~ that acquires imaging data of a subject in an examination region ~~(20)~~;

a reconstruction processor ~~(46)~~ that reconstructs the acquired imaging data into an image representation;

a pair of electrodes ~~(30, 32)~~ adapted to contact a thoracic region of the subject;

an electrical meter ~~(34)~~ that measures a time-varying electrical parameter ~~(70)~~ across the electrode pair ~~(30, 32)~~; and

a monitor ~~(36)~~ that extracts a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the measured time-varying electrical parameter ~~(70)~~.

2. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the time-varying electrical parameter ~~(70)~~ is selected from a group consisting of:

a time-varying complex impedance,

a time-varying resistance,

a time-varying capacitance,

a time-varying inductance,

a time-varying current, and

a time-varying voltage.

3. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the diagnostic imaging scanner ~~(12)~~ is a computed tomography scanner.

4. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the electrical meter ~~(34)~~ includes:

a voltage pulse generator ~~(72)~~ that applies a voltage pulse train to the electrode pair ~~(30, 32)~~; and

an ammeter ~~(74)~~ that measures an electrical current flowing between the electrode pair ~~(30, 32)~~ responsive to the applied voltage pulse train.

5. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, further including:

an imaging controller ~~(64)~~ that receives the respiration characteristic ~~(90, 98, 110, 120)~~ and controls the diagnostic imaging scanner ~~(12)~~ based thereon.

6. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the monitor ~~(36)~~ includes:

a differentiator ~~(94, 106)~~ that computes a time derivative of the time-varying electrical parameter ~~(70)~~.

7. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **6**, wherein the time-varying electrical parameter ~~(70)~~ includes a time-varying resistance, the differentiator ~~(94)~~ computes a first derivative, and the monitor ~~(36)~~ further includes:

a respiration state processor ~~(96)~~ that computes the respiration parameter ~~(90)~~ as one of:

inhaling corresponding to a positive time derivative of the time-varying resistance,

exhaling corresponding to a negative time derivative of the time-varying resistance, and

a breath-hold state corresponding to a substantially zero time derivative of the time-varying resistance.

8. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the monitor ~~(36)~~ includes:

a respiratory cycle phase processor ~~(104)~~ that estimates a respiratory cycle phase ~~(110)~~ based on the time-varying electrical parameter ~~(70)~~.

9. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein the monitor ~~(36)~~ includes:

a calibration ~~(122)~~ that correlates electrical parameter values with a tidal volume of air in lungs of the subject; and

a transform processor ~~(124)~~ that references the calibration ~~(122)~~ to transform the time-varying electrical parameter ~~(70)~~ into a time-varying tidal volume ~~(120)~~ of air in the lungs.

10. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, further including:

an image data binning means ~~(40)~~ for sorting imaging data into respiratory cycle phase bins ~~(42)~~ based on the time-varying respiration characteristic ~~(110)~~, the reconstruction processor ~~(46)~~ reconstructing data in a selected one or more of the respiratory cycle phase bins.

11. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, further including:

an electrocardiograph ~~(66)~~ that measures electrocardiographic data of the subject using at least the pair of electrodes ~~(30, 32)~~.

12. (Currently Amended) The imaging system ~~(10)~~ as set forth in claim **1**, wherein a substantial portion of the thoracic region of the subject is disposed between the contacting electrodes ~~(30, 32)~~.

13. (Currently Amended) A medical diagnostic imaging method including:

acquiring imaging data of a medical imaging patient;

reconstructing at least a part of the acquired imaging data into an image representation;

measuring a time-varying electrical parameter ~~(70)~~ across an electrodes pair ~~(30, 32)~~ during the acquiring of imaging data; and

computing a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ based on the measured time-varying electrical parameter ~~(70)~~.

14. (Currently Amended) The method as set forth in claim **13**, further including::

contacting a thoracic region of the patient with the pair of electrodes ~~(30, 32)~~.

15. (Currently Amended) The method as set forth in claim **14**, wherein the contacting of the thoracic region with the electrodes pair ~~(30, 32)~~ includes:

relatively arranging the electrodes pair ~~(30, 32)~~ with a substantial portion of the thoracic region disposed therebetween.

16. (Currently Amended) The method as set forth in claim **13**, wherein the acquiring of imaging data includes:

passing x-rays through an imaging region ~~(20)~~;

measuring x-ray intensities after passing through the imaging region ~~(20)~~; and

computing x-ray absorption data from the measured x-ray intensities.

17. (Currently Amended) The method as set forth in claim 13, wherein the measuring of a time-varying electrical parameter ~~(70)~~ includes:

applying one of a voltage and a current to the electrodes pair ~~(30, 32)~~;

measuring the other of voltage and current responsive to the applying; and

computing the time-varying electrical parameter ~~(70)~~ based on the applied and measured quantities.

18. (Original) The method as set forth in claim 17, wherein the applying step includes:

applying a pulse train of voltage or current pulses.

19. (Currently Amended) The method as set forth in claim 13, further including:

measuring cardiac cycling data using the pair of electrodes ~~(30, 32)~~.

20. (Currently Amended) The method as set forth in claim 19, wherein the measuring of cardiac cycling data using the pair of electrodes ~~(30, 32)~~ is performed substantially simultaneously with the measuring of a time-varying electrical parameter ~~(70)~~ across the electrodes pair ~~(30, 32)~~.

21. (Currently Amended) The method as set forth in claim 13, wherein the measuring of a time-varying electrical parameter ~~(70)~~ across the electrodes pair ~~(30, 32)~~ includes:

measuring a time-varying resistance across the electrodes pair ~~(30, 32)~~.

22. (Currently Amended) The method as set forth in claim 13, wherein the computing of a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the time-varying electrical parameter ~~(70)~~ includes:

determining a respiration state ~~(90)~~ based on a temporal slope of the time-varying electrical parameter ~~(70)~~.

23. (Currently Amended) The method as set forth in claim 13, wherein the computing of a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the time-varying electrical parameter ~~(70)~~ includes:

selecting a respiration state ~~(90)~~ based on a temporal slope of the time-varying electrical parameter ~~(70)~~, the respiration state ~~(90)~~ being selected as one of:

inhaling corresponding to a positive temporal slope,

exhaling corresponding to a negative temporal slope, and

a breath-hold state corresponding to a generally horizontal slope.

24. (Currently Amended) The method as set forth in claim **13**, wherein the computing of a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the time-varying electrical parameter ~~(70)~~ includes:

computing a respiration rate ~~(98)~~ proportional to a temporal frequency of the time-varying electrical parameter ~~(70)~~.

25. (Currently Amended) The method as set forth in claim **13**, wherein the computing of a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the time-varying electrical parameter ~~(70)~~ includes:

computing a time-varying tidal volume function ~~(120)~~ of air in lungs of the patient based on the time-varying electrical parameter ~~(70)~~.

26. (Currently Amended) The method as set forth in claim **13**, wherein the computing of a time-varying respiration characteristic ~~(90, 98, 110, 120)~~ from the time-varying electrical parameter ~~(70)~~ includes:

computing a time-varying respiratory cycle phase function ~~(110)~~ based on the time-varying electrical parameter ~~(70)~~.

27. (Currently Amended) The method as set forth in claim **13**, further including:

gating the acquiring of imaging data based on the extracted time-varying respiration characteristic ~~(90, 98, 110, 120)~~.